

ANALYSIS OF ENERGY WASTE EFFLUENTS FOR ORGANIC CHEMICALS USING THE MASTER ANALYTICAL SCHEME. Linda Sheldon, Shirley Yung, Roger Wiseman, Larry Michael, and Edo Pellizzari
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A variety of analytical methods were tested during the development of a comprehensive scheme to identify and quantitate volatile organic chemicals in aqueous samples using high resolution gas chromatography/mass spectrometry/computer (GC/MS/COMP) as the major analytical tool. Volatile organics are defined as those compounds which will either elute from a GC column at 300°C in one hour or less or which may be derivatized to meet these criteria.

Highly volatile (bp <175°C), hydrophobic compounds were analyzed using a modified purge and trap procedure. Solvent extraction with pH adjustment served to concentrate the less volatile (bp >175°C) hydrophobic compounds. Ionic organics were concentrated by ion exchange, then chemically derivatized prior to gas chromatography. Lastly, volatile polar organics were concentrated by fractional distillation. As an alternative to direct aqueous injection, the distillate was injected onto a Tenax GC precolumn through a heated injection port, the water vented, and the organics were thermally desorbed into a gas chromatograph. For energy waste effluents, methods which gave a minimum detection limit of 10 ppb with 40% recovery were considered acceptable.

Developed methods were tested on a variety of spiked and unspiked sample waters including energy waste effluents. Specific problems with this sample matrix and test results will be presented. This research was supported by EPA Contract No. 68-03-2704.